Kachelgrundofen

Traditional Basic Tile Stove

The Australian National University
Institute of the Arts

Canberra School of Art
Graduate Diploma of Art
1994

Brigitte Enders

REPORT PRESENTED IN FULFILLMENT
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To Clayworks, Dandenong.
To Walker Ceramics.
To Gilbert Riedelbauch.
To Robert Foster.
To Glen Dunn.

ABSTRACT

TRADITIONAL BASIC TILE STOVE; Research into a slow combustion heating system, having it's origin in the 15 th. century in the alpine regions of Europe. A study taking the form of an exhibition of ceramics to be exhibited at the A.N.U. Drill Hall Gallery from August 3rd. to the 21st, 1994. The exhibition will comprise the outcome of the studio practice component (100 %) together with a report which documents the nature of the course of study undertaken.

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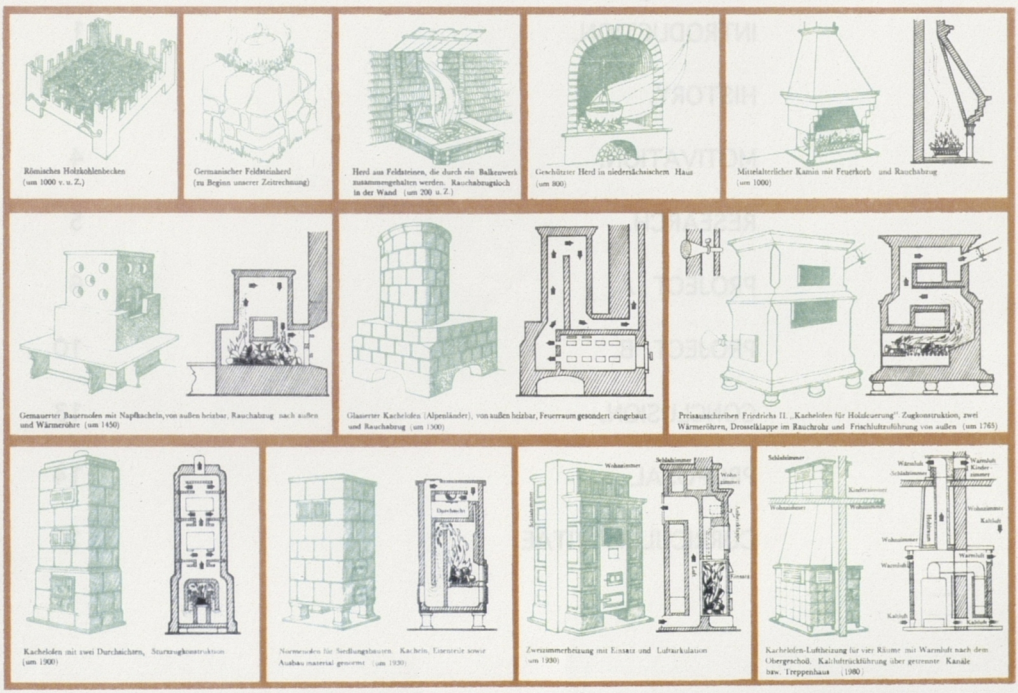


The technical development of the tile stove. From 1000 B.C. to 1980.

INTRODUCTION

A traditional tile stove is a room heating stove which is built up from floor level without a metal insert functioning as a heating compartment. It combines heat storage with high fuel efficiency burning. The fuel used is dry, soft, or hardwood. It is initially heated with the door open allowing plenty of oxygen for combustion. As soon as there are no flames present, the airtight door is closed and it remains like this until the next heating procedure in 12 to 24 hours.

Like many successful constructions it has a very simple design. The ceramic surface is a fired - porous - refractory - clay which stores the heat. Based on it's physical qualities, this material poses some excellent advantages in heat conserving engineering. It has low thermal conductivity and therefor a high heat storage capacity. During the heating up period there is not only the heat of fire and embers stored but this unit also stores the waste heat of the gaseous products of combustion through the passage of flues that eventually flow towards the chimney. The heat is transferred on the way to the firebrick and tile surfaces which finally by way of convection transfers to the whole area of the room. Because of this highly efficient transformation, it is possible to have stored (after one hour of heating) warmth for a whole day. This basic wood fired tile stove does not need a grate. The insulating ash layer provides the best firing conditions.

The warmth created by the tile stove is believed to be a very healthy warmth. The reasons for this is seen in the physical qualities of our own body. 45% of our warmth we loose through radiation, 55% through respiration and convection. In exactly this pattern the tile stove produces its warmth without the side effects of dry air or dust, which often accompanies other heating. This is why urban medical health studies recognise this kind of heating as beneficial for human well being and health.

HISTORY

There the tile stove originated from is not quiet clear although there is a theory that the brick-built stove (not the tile stove) had its origin in the area we now call Russia or Russian Asia. Known through literature and fairytales, the stoves were centres of the Russian farmhouses and big enough to be sleeping places for humans and animals. Wherever the origin, the alpine regions of Europe a have tile stove tradition of some five hundred years. The early version had a square or rectangular base and a rounded upper part. The surface of the upper part contained either pot shaped or cylindrically shaped tiles.

The first drawings of tile stoves date back to the first third of the 14th Century, in Switzerland. A more sophisticated variation was discovered in the frescos in the canonicates house of St. Stephans cathedral in Konstanz/Germany. The frescos show a series of 21 pictures which show how women used to spend their time. On top of the fresco depicting a tile stove is written in Gothic majuskel-writing: ," *ICH LIG HIE ALS AU FUDE SOL - HINDER DEM OFEN IST MO WOL"* , which translates as :"I lie here like a lazy sow behind the stove I feel w e l l " .

Drawing after the fresco in Konstan/Germany.

Many variations of the early tile stoves still existing in the countries of the alps and the findings in Zurich/Switzerland and Konstanz make it very plausible that it originated from the alpine region.
From the 14th century on potters gave the tile stove a vast variety of designs. Tile stove building involved modelmakers,embossers, painters, sculptors and architects whom reflected the current artistic style of the time and

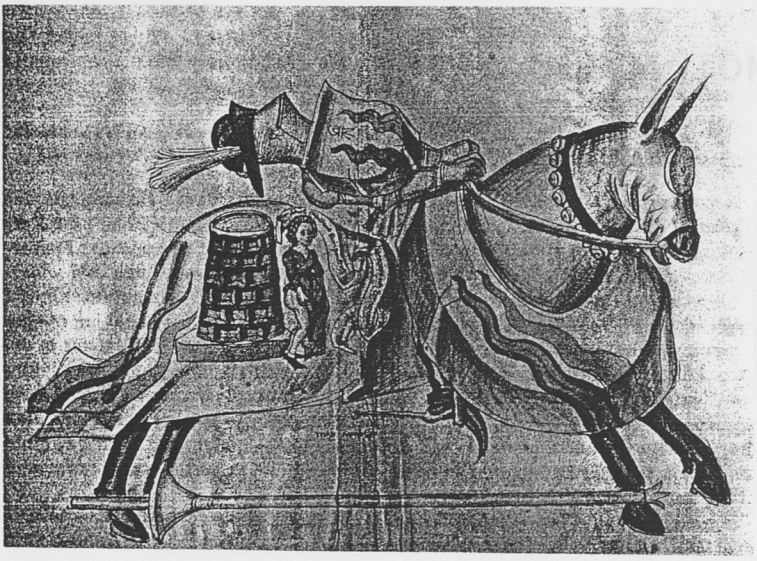


Image of tile stove on saddle blanket, 1510.

often copied the architectural design of the period in which they were built. The tile stove was the life conserving part of a house. It had a strong presence in the folkloric literature of the German speaking regions and was often referred to as a person.

As time passed local potters reduced their part of the work to only build up the stove. The artistic design and the tile design were often realized in different locations - sometimes in towns, far away from each other. That explains why very popular designs are found to have spread over the whole of the German speaking communities and some times even over those borders. By the 18th century the tile stove no longer retained its importance as a one-of-a-kind artwork. Beside a few exeptions it became part of the furniture. In a strict sense, the stoves in baroque and rococo period can not be referred to as tile stoves any more. The most culturally rich period for tile stove development ranges from the 14th to the 17th century

The 1960`s renaissance of the tile stove emerged from the traditional version of the stoves of the alpine farmhouses.

MOTIVATION

In 1973 I moved from a little town near the old east/west German border to Hamburg. One day I found a pile of ceramic squares in the yard. In the front house where I was renting my studio they started to modernise their heating system and the old art noveau stove had to go. For the price of taking it out of the yard I was allowed to have it. I cleaned and stored it, and forever had the wish to make one myself. The stove became lost in 'life' which was good in the sense that I did not have to consider whether to pack or not to pack it when in 1982, I moved to Australia, where I believed one does not need such warm things.! After suffering many years through cold Canberra winters the old wish was revived. All heating systems available in Australia seemed to deal with by heating periods where one does not have to think about more efficient methods of creating warmth. But one does need to heat houses here for 4 to 5 months a year. A tile stove could very well be a source of pleasant, quiet and clean heat. In 1991 I made the tile stove the theme of my post graduate proposal.

Late Gothic tile stove - 1501
Salzburg, Austria.

RESEARCH

Starting out with one *"build your own tile stove"* hobby book and one dissertation about tiles, I was embracing both ends of a vast research territory. As well I either own and read most of the professional books concerned with the functioning of the stove. I know now that if the mortar has light colouring then I have to add a special other cement and fine quartzsand. I know that I have to be careful not to buy slightly violet coloured fire bricks because it stands for a bad firing - I made my own batch of firebrick clay and tested its performance. As well as the earthenware mixture for the tiles itself which I later on had produced by Clayworks in Dandenong.

The contact I made with Nu-Brick provided me with the raw material for building bricks in case I could not get hold of a semiporous brick necessary for areas in the stove where it is necessary to bridge spaces between inner flues and tile mantle. Most of the building bricks are vitrified and therefor do not have a good ability to store heat. There are hundreds and hundreds of bits of information collected, executed and written down - too many to include in the framework of this report.

PROJECT A

Cornerstove
Planned location: living room size
~25 to 30 qm2

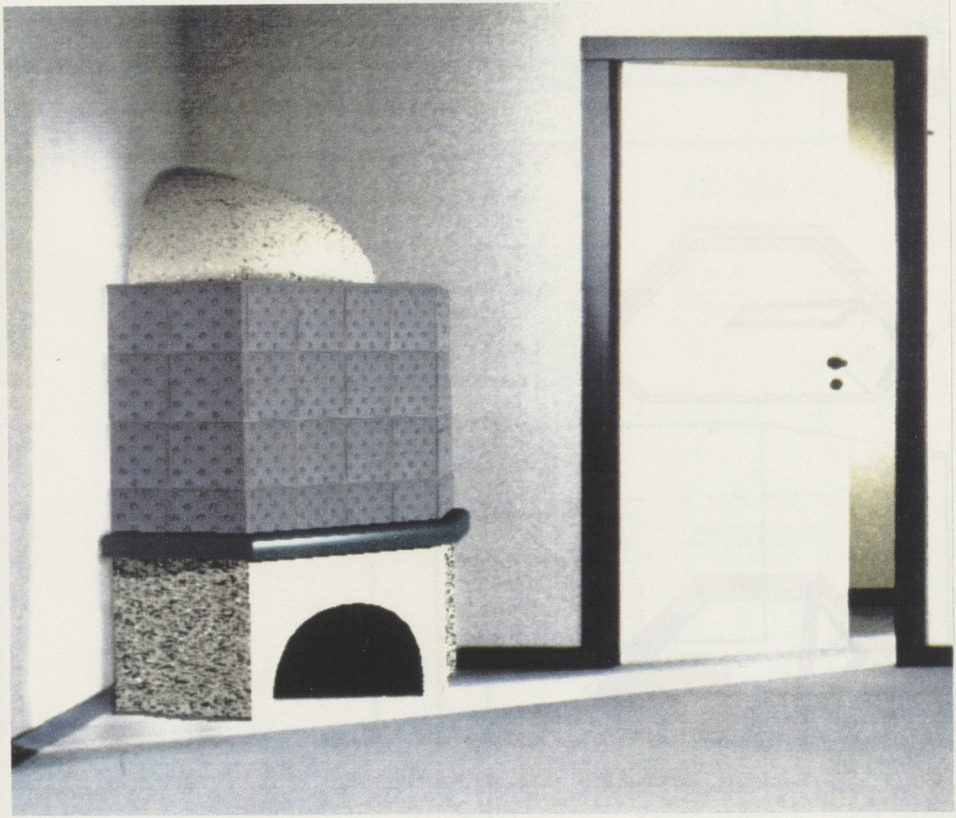
Elements of the monumental presence of the tile stoves in the Gothic I found very fascinating, but to apply them to our kind of architecture which is not meant for eternity anything with these dimensions and demand, I thought to be too "gotico" (ital.: for barbaric). At this stage I felt more comfortable to lean towards a design I knew from the northern parts of Germany where many tile stoves were installed in a corner position. The place in the corner made it more a part of the architecture of the room. A fact with which I agree. It should be like a warming guest in the room, but retentive.

Door in Toscani.

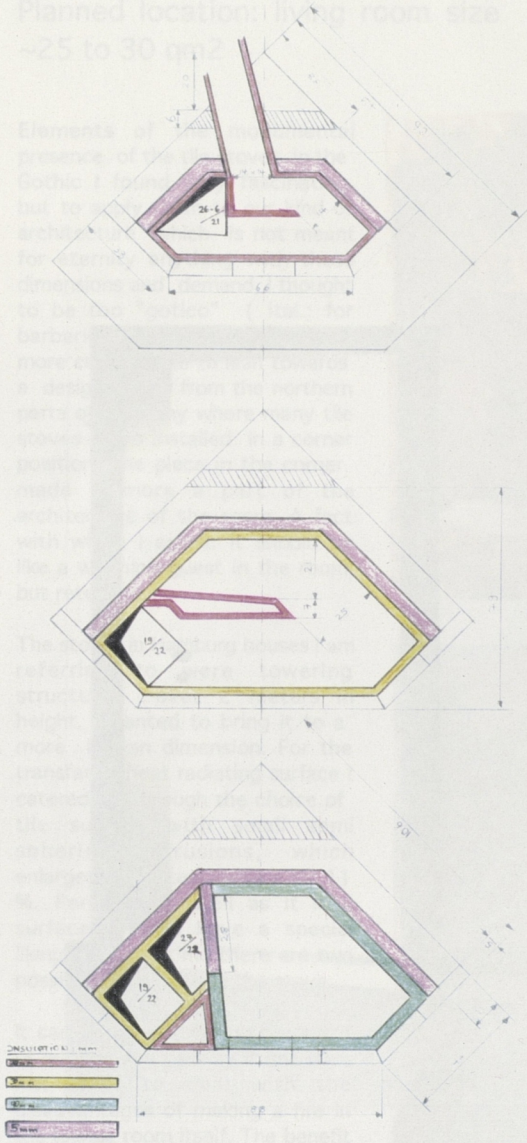
The stoves in Hamburg houses I am referring to were towering structures over 2 meters in height. I wanted to bring it to a more human dimension. For the transfer of heat radiating surface I catered for through the choice of tile surface with small semi spheric protrusions, which enlarges the actual surface by 11 %. Per tile. As well as it is a surface which I have a special liking for some time there are two possibilities in heating the stove .

It can be done either in the room or outside in a hallway if one does not want to deal with the disadvantages of making a fire in the lounge room itself. The benefit of this variation is: that it would also heat as well the hallway which could be further improved by adding radiating surface "tiles" around the firing hole.

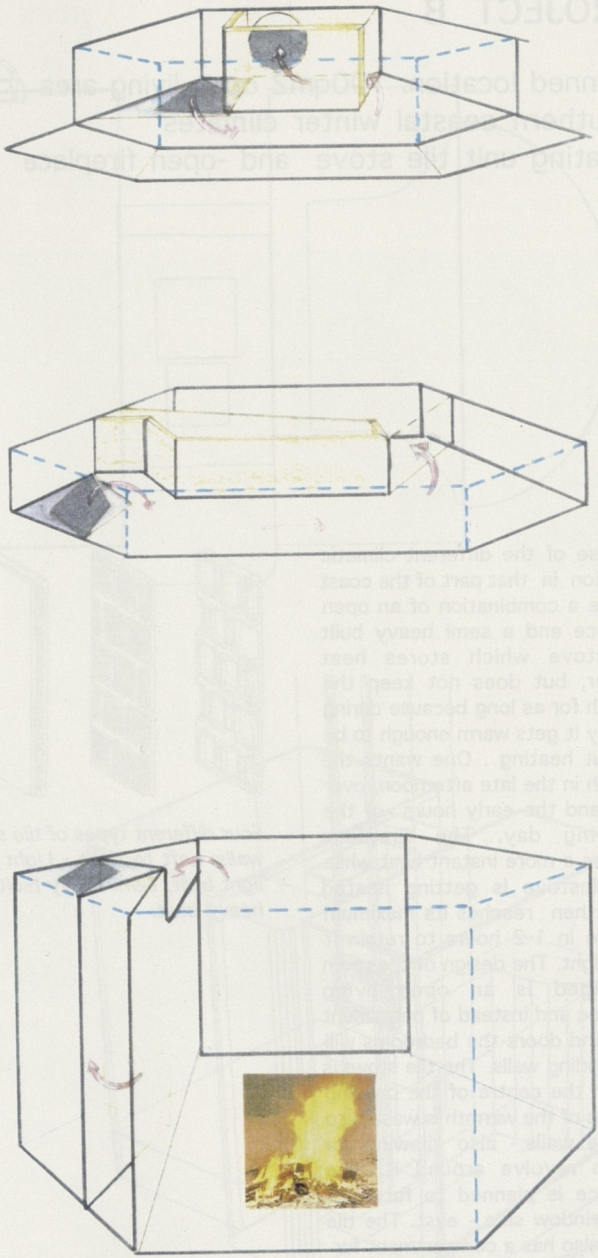
Skin of a Nuba woman.



Computer simulated image of corner stove.



Technical drawing of flue sections .

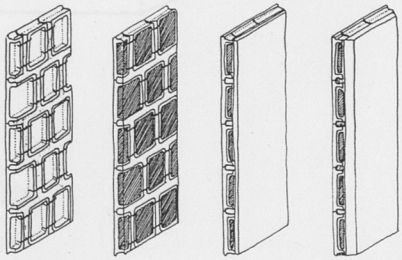


Visualisation of the flow of gases.

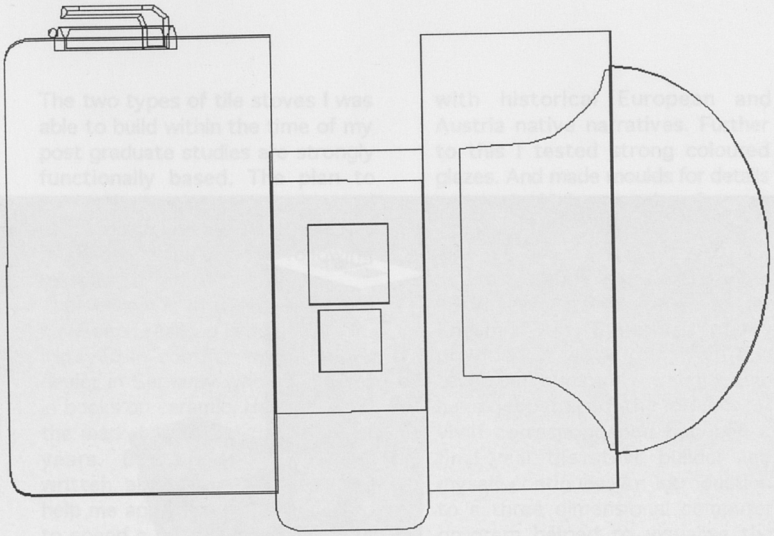
PROJECT B

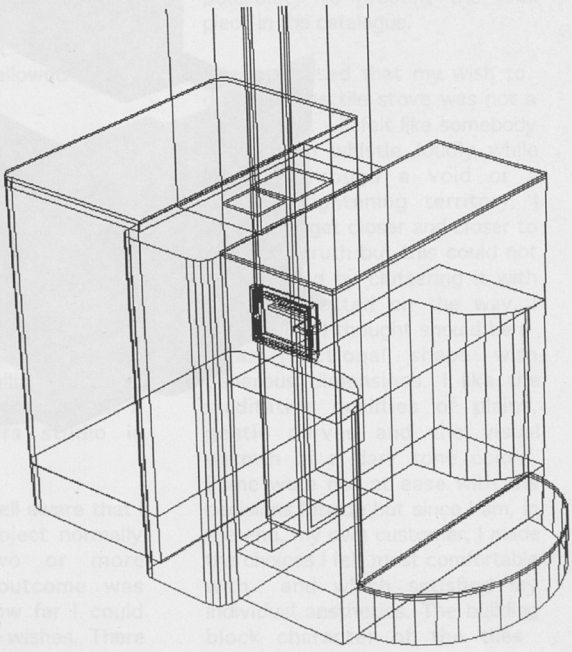
Planned location: 100qm2 open living area
southern coastal winter climates
Heating unit tile stove and -open fireplace

Because of the different climatic condition in that part of the coast I chose a combination of an open fireplace and a semi heavy built tile stove which stores heat quicker, but does not keep the warmth for as long because during the day it gets warm enough to be without heating . One wants the warmth in the late afternoon, over night and the early hours of the following day. The fireplace supplies a more instant heat while the tilestove is getting heated which then reaches its maximum storage in 1-2 hours to retain it over night. The design of the room envisaged is an open living situation and instead of permanent walls and doors the bedrooms will have sliding walls. The tile stove is built in the centre of the building so none of the warmth is wasted to outside walls,- also allowing for life to revolve around it. The fireplace is planned to face the main window side - east. The tile stove also has a compartment for keeping things warm and a seperate compartment for baking bread. This aspect of the tile stove faces the dinning and kitchen areas. Wood storage and fire door area close to the south side exit.

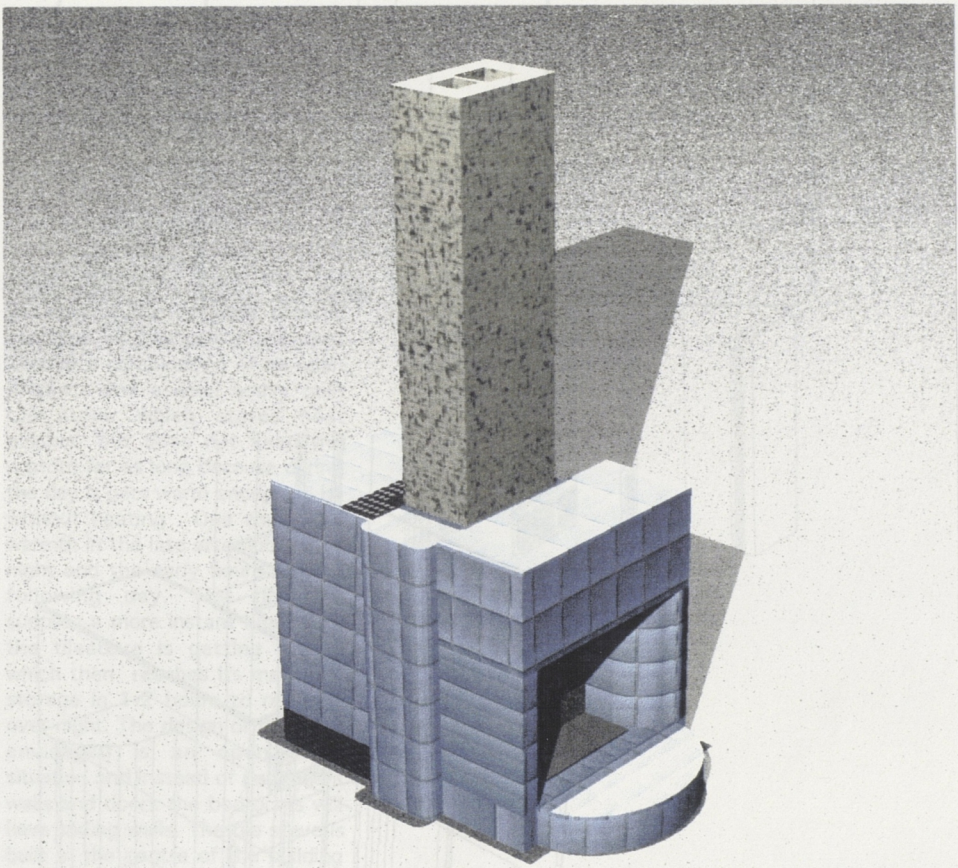


Four different types of tile stove walls; Left to right - Light biult, light biult, semi heavy biult and heavy biult.





Wire frame Image. A - top view.
B - orthographic view.



Rendered Image 12
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Conclusion

The two types of tile stoves I was able to build within the time of my post graduate studies are strongly functionally based. The plan to apply the sculptural qualities of my works in ceramic had to be set in second place for the following reasons:
The technique in which this could have been realised is not available. I stayed in contact with a book dealer in Germany who specialises in books on ceramic. He monitored the market for me during the past years. But nothing has been written about this technique to help me apply it. I would have had to spend a considerable time in a workshop overseas using this technique. Contact had been made with a tile stove builder who works in what is called there "ueberschlagtechnik" but neither time nor finances allowed me to take on this step.

Modifying the functional inner part of the system to fit a more free external design is still the part with which I am uncertain . Yet even at this stage, where I have gathered so much information, I would not plan to realise it on my own. The choice fell for the tile to function as the traditional building unit.I become familiar with this approach during time spent at a tile stove builders studio in Bavaria/Germany.

I was all the time well aware that I had taken on a project normally executed by two or more specialists. The outcome was always open to how far I could carry my proposed wishes. There have been times when I solely concentrated on the technical side of the inner construction. I was then drawn to extensively decorate the external skin of the tile stove with historical European and Austria native narratives. Further to this I tested strong coloured glazes. And made moulds for details - one of which was taken from an iguana.

The assistance gained from the "Staatliche Fachschule Fuer Keramik" in Bavaria/Germany provided a backup to difficult technical questions which could have jeopardised the project. A vivid correspondence between a final year tile stove builder and myself continues. An introduction to a three dimensional computer program helped to visualise the stoves in a simulated environment. This was in fact the only possibility to present the final piece in the catalogue.

I soon realised that my wish to decorate the tile stove was not a honest one. - it felt like somebody needing to whistle loudly while passing through a void or a slightly frightening territory. I wanted to get closer and closer to the basic truth but this could not be achieved by cluttering it with ballast collected on the way. I chose what I thought should be a clear functional shape with generous dimensions. I like the meditative qualities of plains, gentle curves and the visual warmth of a dark tone colour. Some were not at ease with the decisions I made but since I am, in the end, my own customer, I made the choices I felt most comfortable with and which satisfied my individual aesthetics. The building block character of the tiles allowes variations to the theme. The way I chose gave me great confidence to compose with that which I have.

PROPOSAL

PREAMBLE

Because of the uniqueness of this proposal Mr Allan Watt has suggested that this application be made only in part so that the nature and overall concept can be discussed by the Post Graduate panel before a more detailed outline with specific drawings are submitted.

As the proposal involves the inclusion of industrial, architectural and engineering components, it is expected that the more detailed proposal will include advice and comments from experts in this field, some of whom have already offered their services.

AIM

The central purpose of this proposal is the development of a contemporary artistic concept around a traditional European tile stove using sculptural and surface qualities which are already being applied to my current studio work. While essentially practical in nature, it is the sculptural qualities as related to architectural space that will be the primary pursuit in transforming a traditional architectural item into a contemporary idiom.
I have discussed this outline with Mr. Watt and although it departs from the usual studio/exhibition ceramics programs undertaken in the Ceramics workshop in the past, he is supportive of the proposal citing the work of former post graduate student, Peter Lockwood's (Woodwork - Gold and Silver smithing) imaginative lamps as not being a dissimilar proposal.

INDUSTRIAL DESIGN/ARCHITECTURAL LINKS

Having an interest and background in industrial design and some experience with computer aided design, I see that this proposal offers links with industry - an aspect which has, in the past, been only partly recognised and little supported by the workshops of the School. Mr Watt acknowledges that this proposal will enhance the links with the industrial design department of the School of environmental Design at the Canberra University, especially with Mr. Bill Green and Mr. Donald Dunbar who, through Bill Huff-Johnston's close liaison, has assisted ceramic students on numerous occasions with design and architectural problems. The proposal also requires the advice of combustion and refractory specialist - both areas of expertise being found in the ceramic and industrial engineering fields. I hope to draw on recent overseas technical development especially from connections I have in Germany.

SOCIAL AND ENVIRONMENTAL ISSUES

While not central to this investigation I believe that this proposal becomes particularly when considered in the light of present concerns about the environmental impact of combustible fuels and the conservation of resources.
The practical efficiencies envisaged in this undertaking will undoubtedly have considerable interest to designers and architects of contemporary domestic dwellings and public buildings.

MATERIAL RESEARCH

This proposal will require a considerable amount of material research especially in the area of clay body formulation and other refractory / insulatory materials. The Ceramic workshop is particularly suited for the preparation and testing of these materials and staff have a background experience in clay body formulation and modern industrial/kiln insulation.

SUPERVISION OF PROGRAM

As this proposal necessitates an artistic/industrial combination, I propose that my main supervisor be from the ceramic staff concerning aesthetic issues and much of the ceramic technology, but I will draw on other outside advisers, where necessary, in the design/architectural, industrial and heating fields.

STUDY OPTION AND TIME FRAME

As this program will undoubtedly take considerable time to develop and realise, I request that the proposal be regarded as a part time study, taking two calender years, enabling mr to not only appropriately develop the practical aspects of this undertaking but bring the artistic nature of the program to the highest level. I believe the material research will be particularly time consuming and have benefits ion a number of ceramic applications. For this reason I would like to propose this investigation be considered as the major part of the research option and I therefore apply for Post Graduate studies by studio practice and research.

CONCLUSION

I submit this outline for general consideration by the panel and will during the interview bring an amount of visual material by which I can discuss and explain my intentions.

Brigitte Enders
Curriculum Vitae

1949 Born In Offenbach/Main - Germany

Education

1991 - Candidate For Graduate Diploma Of Art
Canberra School Of Art, Institutof The Arts, ANU
1988 Canberra University, Industrial Design
1980 Degree In Industrial Design
1975 - 1980 Academy Of Fine Arts , Hamburg/Germany
1971 - 1972 School For Ceramic Design, Hoehr-Grenzhausen/Germany
1969 - 1970 Academy Of Fine Arts, Kassel/Germany
1966 - 1968 Institute For Paedagogic ,Fulda And Wiesbaden/Germany

Employment And Activities

1988- Canberra Institute Of The Arts, Part Time Teaching1
1982 Studio In Canberra/ Australia
1974- 1975 Ceramic Therapy For Children With Behavioural Problems, Hamburg/Ger.
1973- 1982 Studio In Hamburg/Ger
1970 Freelance Designer For 'staatliche Porzellan Manufactur', Berlin/Germany

Selected Exhibitions

1992 'Ceramic Art From Germany', Kennedy Centre,
Washington DC And The Cambell Museum, Cambell NY
1991 New York International Gift Fair, 'german Crafts'
1991 'Deutsche Keramische Kunst Der Gegenwart' Keramion Frechen/Ger
1990 'Crafts 1990', Mewat Market Centre, Melbourne
1990 Perth Gallery, Perth/Australia
1988 'Over Here', 7 Migrants Crafts People In Australia,Canberra School Of Art, Canberra/Australia
1987 Galery Handwerk, 'craft From Northern Germany',Munich/Ger

1986 Touring Exhibition, 'arts And Crafts Of Hamburg And
Northern Germany', Japan - China - Australia
1984 Museum Fuer Kunst Und Handwerk, Triennale Des
Deutschen Kunsthandwerks, Frankfurt/Ger
1983 "Tendencies Of Modern German Ceramics" Work Out Of
Private Collections In Baden-Wuettemberg
Gallery Of Sindelfingen, Sindelfingen/Ger -
Badisches Landes,Museum, Karlsruhe/Ger
1981 Museum Fuer Kunst Und Handwerk, 'Triennale Des
Deutschen Kunsthandwerks', Frankfurt/Ger
1980 European Ceramic 1950-1980, Coll.Dr. Hans Thiemann
Duesseldorf And Hamburg/Ger
1979 Westerwald Preis, Hoehr-Grenzhausen/Ger
1970 Fockemuseum Bremen/Ger, Dr. Hans Thiemann Collection
1969 International Triennial Of Decorative Arts -Stuttgart/Germany

Solo Exhibitions

1987 Holdsworth Galleries , Sydney, Australia
1982 Emslandmuseum, Soegel, Germany
1981 Galerie Illmer, Osnabrueck, Germany
1980 Galerie Boewig, Hannover, Germany

Collections

Sammlungen Der Veste Coburg, Coburg/Ger
Keramion, Frechen/Ger
Westerwald Museum, Hoehr-Grenzhausen/Ger
Emsland Museum, Soegel/Ger
Kulturgeschichtliches Museum, Osnabrueck/Ger
Museum Fuer Moderne Keremik, Deidesheim/Ger
Sammlung Dr, Hans Thiemann, Hamburg/Ger
Art Gallery Of Western Australia, Perth/Australia

BIBLIOGRAPHY

Anthony, Emil / Madaus, Christian..
Perspektvisches Zeichnen Von Kachelofen Und Kaminen.
Verlag, G. Kopf GMBH.
Stuttgart
1984

Franz, Rosemary.
Der Kachelofen.
Akademische Druck und Verlaganstalt,
Granz.
Austria.
1981

Grutzmacher, Bernd.
Ofenkacheln.
Callwey Verlag.
Munich.
1984

Henhalp, Nikolaus / Madaus, Christian.
Der Kachelgrundofen. Planung, Konstrktion und Aufbau 3 Edition.
Verlag G. Kopf GMBH.
Stuttgart
1986

Maduas, Christian.
Die Geschichte Der Technischen Entwicklung Des Kachelofens. 3 Edition.
Verlag G. Kopf GMBH.
Stuttgart
1984

Muller, C.G.
Die Tonofenfabrikation.
Hartlebens, A. Verlag.
Vienna und Lipzig.
1915.

Pfestorf, K.H.
Kachelofen Handwerksgerecht Gebaut.
Bauverlag.
Wiesbaden, Berlin.
1980

Schlanke/schobes, Berger.
Selbst ofen und Kamine Bauen. 2 Editiion.
Compact Verlag.
Munich
1989

Strebel, Ottmar.
Behaglchkeit Durch offene Kamine Und Kachelofen.
Fachschriftenverlag.
Fellbach, Stuttgart.
1981